

WHAT IS CLAIMED IS:

1. A fuel cell system comprising:
 - a fuel cell; and
 - 5 a hydrogen gas supply portion which supplies the fuel cell with hydrogen gas,
 - wherein
 - the hydrogen gas supply portion is provided with an odorant treatment portion which treats an odorant in a mixed gas containing the hydrogen gas and the
 - 10 odorant, and
 - the odorant treatment portion has a function of supplying the fuel cell with hydrogen gas by capturing the odorant in the mixed gas and a function of recovering its capturing capacity by decomposing the captured odorant.
- 15 2. The fuel cell system according to claim 1, wherein
- the odorant treatment portion captures the odorant contained in the mixed gas through adsorption.
3. The fuel cell system according to claim 2, wherein
- 20 the odorant treatment portion includes an odorant removal portion containing a porous adsorbent for adsorbing the odorant contained in the mixed gas and a catalyst for promoting decomposition of the odorant adsorbed in the porous adsorbent, and a decomposition support portion which decomposes the odorant adsorbed in the porous adsorbent.
- 25 4. The fuel cell system according to claim 3, wherein
- the adsorbent contains activated carbon.
5. The fuel cell system according to claim 3, wherein
- 30 the adsorbent contains zeolite.
6. The fuel cell system according to claim 3, wherein
- the catalyst contains a noble metal catalyst.

7. The fuel cell system according to claim 3, wherein

the decomposition support portion includes an oxygen gas supply portion which supplies the odorant removal portion with oxygen gas,

5 the odorant treatment portion further includes a first flow path switching portion which selectively introduces the mixed gas and the oxygen gas into the odorant removal portion, and

the odorant removal portion oxidizes and decomposes the adsorbed odorant by means of the oxygen gas supplied from the oxygen gas supply portion.

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8. The fuel cell system according to claim 7, further comprising:

a control portion which controls the odorant treatment portion, wherein

15 the control portion controls the oxygen gas supply portion and the first flow path switching portion to supply the odorant removal portion with the oxygen gas during a period in which an estimated amount of the odorant adsorbed by the odorant removal portion is equal to or larger than a predetermined amount with operation of the fuel cell system being stopped.

20 9. The fuel cell system according to claim 7, further comprising:

a post-decomposition gas passage through which post-decomposition gases discharged from the odorant removal portion flows when the odorant treatment portion decomposes the odorant adsorbed by the odorant removal portion; and

25 a second flow path switching portion which introduces the hydrogen gas into the fuel cell if the hydrogen gas is discharged from the odorant removal portion, and introduces the post-decomposition gases into the post-decomposition gas passage if the post-decomposition gases are discharged from the odorant removal portion.

30 10. The fuel cell system according to claim 9, further comprising:

a control portion which controls the odorant treatment portion, wherein

the control portion controls the oxygen gas supply portion and the first flow path switching portion to supply the odorant removal portion with the oxygen gas, and controls the second flow path switching portion to introduce the post-decomposition gases discharged from the odorant removal portion into the post-decomposition gas passage during a period in which an estimated amount of the odorant adsorbed by the odorant removal portion is equal to or larger than a predetermined amount with operation of the fuel cell system being stopped.

11. The fuel cell system according to claim 3, wherein

the decomposition support portion includes a heating portion which heats the odorant removal portion, and

the odorant removal portion reduces and decomposes the odorant adsorbed in the porous adsorbent while being heated by the heating portion, by means of hydrogen gas contained in the supplied mixed gas.

12. The fuel cell system according to claim 11, wherein

the odorant treatment portion further includes a post-decomposition gas passage through which post-decomposition gases discharged from the odorant removal portion flow during decomposition of the adsorbed odorant, and a flow path switching portion which introduces the hydrogen gas into the fuel cell if the hydrogen gas is discharged from the odorant removal portion, and which introduces the post-decomposition gases into the post-decomposition gas passage if the post-decomposition gases are discharged from the odorant removal portion.

13. The fuel cell system according to claim 12, further comprising:

a control portion which controls the odorant treatment portion, wherein

the control portion controls the heating portion to heat the odorant removal portion and controls the flow path switching portion to introduce the post-decomposition gases discharged from the odorant removal portion into the post-decomposition gas passage during a period in which an estimated amount of the odorant adsorbed by the odorant removal portion is equal to or larger than a predetermined amount with operation of the fuel cell system being stopped.

14. A hydrogen gas supply unit which supplies a predetermined apparatus with hydrogen gas, comprising:

an odorant treatment portion which treats an odorant in a mixed gas containing hydrogen gas and the odorant,

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wherein

the odorant treatment portion has a function of supplying the predetermined apparatus with hydrogen gas by capturing the odorant contained in the mixed gas and a function of recovering the capturing capacity by decomposing the captured odorant.

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15. A method of controlling a fuel cell system, comprising:

supplying an odorant removal portion with a mixed gas containing hydrogen gas and an odorant, causing the odorant removal portion to capture the odorant contained in the mixed gas, and supplying the fuel cell with the remaining hydrogen gas;

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determining whether or not an estimated amount of the odorant captured by the odorant removal portion is equal to or larger than a predetermined amount; and

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decomposing the odorant captured by the odorant removal portion if it is determined that the estimated amount of the captured odorant is equal to or larger than the predetermined amount.

16. The method according to claim 15, further comprising:

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introducing to the outside post-decomposition gases which are produced by decomposing the odorant in the odorant removal portion and which are discharged from the odorant removal portion.

17. The method according to claim 15, further comprising:

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promoting decomposition of the odorant by supplying the odorant removal portion with oxygen gas.